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PRODUCT LINES AND PERSONNEL ASSIGNMENTS

In the continuing effort to provide the best possible computer service, the Centre has assigned three staff members to positions of responsibility for key product areas. They are Sam Goldfarb for Interactive Terminal Systems, Joyce Walton for IBM 7094 II services, and John Boddy for the High Speed Job Stream.

The general terms of reference for this new position is to develop each service area to most effectively meet the needs of its users. The incumbents have been assigned broad authority in order to meet this challenge.

The regular OS/360 production remains under the management of Mr. A. J. Wickens. The Users' Service Group continues its role of advising and assisting these users, as well as supporting the three special areas. Mr. Robin Williams is the Manager.

This Newsletter is reconfigured to support these developments. General News, Products & Services News, and Technical Tips will now be regular subdivisions.

QUALITY CONTROL

Mr. Herb Kugel has been assigned new duties in the area of quality control. Herb is busy setting up increasingly effective credit request procedures as well as analysing systematic faults in order to expurgate the sources of error.

Mr. Kugel will support all functional and product-line managers in their efforts to produce better work more effectively. He will also assist the Directorate in establishing measures and standards in methods and performance.

STATISTICAL PACKAGES

Andy Kowaliw has recently joined the Users' Services Group. Initially he will be responsible for looking after the statistical packages supported by UTCC. At the time of writing these are the Biomedical Package (BMD) and the statistical Package for the Social Sciences (SPSS). (Evidence of Andy's work on the latter can be seen elsewhere in the newsletter).

With respect to BMD, we have ordered updated versions of the source decks for the BMD and BMDX series. From these we

STATISTICAL PACKAGES (Cont'd)

intend to create load modules for those programs not available from the Department of Geography. Eventually we plan to have all the programs available on one of the System Packs.

Andy will also be looking at the S/360 DATA TEXT package when it arrives from Harvard. People wishing to consult him for advice on statistical matters will find him in Room 129, Sandford Fleming Laboratories, local: 8701.

CANADIAN STANDARDS ASSOCIATION

Your editor, as chairman of the Canadian Information Processing Society (Toronto) Special Interest Group on Standards, has now found himself a member of the CSA Subcommittee on Publicity for Computers, Information Processing and office machines. Information on both CSA and CIPS activities in this area is available in Room 105, Sandford Fleming Laboratories.

DON TOUGH, MAN OF THE YEAR

The Chief Operator at UTCC has been named the Outstanding Young Man of the Year by the Mississauga Junior Chamber of Commerce. Don will go on to the provincial competition sponsored by the Ontario Jaycees.

His nominator Mr. Rudy Bos praised Tough's ability to "relate with youth" and his involvement with young boys at "every level of Scouting."

Don has been an executive of the Park Royal Community Association, district commissioner of the South Peel Boy Scouts, a member of the St. Bride's Curling Club and a member of the South Peel Centennial Campsite Fund.

USERS' REFERENCE MANUAL

The procurement of distinctive, practical, inexpensive covers for the new manual has gone wrong. The supplier has had both technical and inventory difficulties. We groan, for the material has lain ready and waiting for weeks. We now expect distribution to start before January month-end.

COMPUTER RESEARCH FACILITY

1. CRF Users' Meeting

The first monthly CRF Users' meeting of 1971 was held in room SF101 at 12.30 p.m. on Friday January 22nd, 1971. All CRF users were invited to attend. Subsequent meetings will be held on the fourth Friday of each month. Notice of meetings will be given in the CRF Information Bulletins.

2. Staff Changes

Ken Weir (360 Operations) has been transferred to the Software Support Group as a trainee programmer.

Replacing Ken in 360 Operations is June Hughes, former Senior Operator of the Engineering Undergraduate Terminal.

3. Addition to CRF's Data Acquisition Facility

CRF has now obtained a Philips Ana-log 7 analog tape recorder. This is an eight track (seven data tracks, one voice monitor track) FM recorder which uses cartridge loading 8 inch reels of 1/2 inch tape. (The cartridge feature eliminates any loading or tape threading problems.) Each of the seven data tracks can be used for either direct or FM recordings. The machine has four speeds, ranging from 15/16 to 30 inches per second. For FM recording the unit has a frequency response of 0 to 10 KHz at 30 inches per second and for direct recording at 30 inches per second the response is 250 Hz to 100 KHz.

This recorder can now be rented from CRF. Users having their own Analog 7 who would like their tapes played back into the RADDT for digitalizing at the 360/44, need only bring their tapes to the laboratory where they can be played on the CRF Analog 7.

For more detailed technical specifications call Clyde Stevens at 8853; for rental information call Joyce King, 8946.

NEWS OF INTER-UNIVERSITY COOPERATIVE PROJECTS

The fourteen Ontario Universities have formed a cooperative Library Interest Group (C.L.I.N.G.) with the following terms of reference:

1. To recommend to the Universities in Ontario on program library classification structures.
2. To recommend to the Universities in Ontario on programming standards and convention for library programs.
3. To recommend to the Universities in Ontario on standards of documentation in program libraries.
4. To recommend to the Universities in Ontario on program evaluation procedures for library programs.
5. To recommend to the Universities in Ontario on the development or collation of specific programming packages in response to the needs of users.
6. To recommend to the Universities in Ontario on the development of a cooperative program library system.

It is hoped that one of the useful results of the activities of the group will be the development of inter-university program libraries. As a first step, C.L.I.N.G. is preparing an index of all software currently available in the universities. It is asking the users of the University of Toronto Computer facilities to cooperate by providing the names and a brief description of any program or program packages which they may have in private libraries and which may be of interest to users in other universities. This program or package need not have been developed at the University of Toronto.

Users are asked to contact Mr. Robin Williams, Manager Users' Service Group (928-2694) with software information. Mr. Williams has kindly consented to coordinate the University of Toronto index on behalf of C.L.I.N.G.

CIPS (Toronto) ANNUAL SEMINAR

The annual seminar operated by the Toronto Branch of the Canadian Information Processing Society will be held on Tuesday, February 2nd, 1971, at the Inn on the Park. Brochures are available at the Computer Centre, Room 105, Sandford Fleming Laboratories.

The objective in selecting the program is stated as intending to cover a fairly broad spectrum of subjects that are of interest and concern to today's practitioner in the field of Information Processing. Dr. C. C. Gotlieb is one of the featured speakers.

PERSONNEL CHANGES

Further changes to the UTCC personnel complement than those mentioned on Page 1, include the addition of Mr. Bill Hayes to Users' Service Group and Miss Nancy Edmison has returned to the secretarial area. Murray Tucker, Bill Cundiff and Gilles Brasseur have left the operations ranks since last month.

SSB ISSUED

1:71 System/360 No.2 Shutdown on Weekend of January 15th to 18th, 1971.

CONVERSATIONAL PROGRAMMING SYSTEM - REMOTE JOB ENTRY

What is it?

CPS-RJE is now available. CPS-RJE is a means by which a user can construct a program at a typewriter-like terminal, alter the program using the various CPS editing commands, and schedule it for execution under HASP.

Service Schedule

The hours of service will the same as for CPS, as follows:

Monday, Wednesday, Thursday, Friday

9:30 a.m. - 4:45 p.m.

7:30 p.m. - 6:45 a.m.

Tuesday

9:30 a.m. - 4:45 p.m.

9:00 p.m. - 6:45 a.m.

Saturday, Sunday

9:30 a.m. - 4:45 p.m.

NOTE: 1) Service after 3:00 a.m. may on occasion be preempted for specially scheduled work.

2) During the school period, January through April, CPS-RJE will be available on Tuesday evenings from 7:30 p.m.

Users' Manual

A description on the use of CPS-RJE may be found in the CPS Terminal Users' Guide. A special users' guide is currently being prepared and, hopefully, will be available shortly.

Job Submission

Special changes have been made with respect to JØB submission to accomodate the 3-part JØB card. CPS-RJE will itself supply the first part of the 3-part JØB card as the first card of the JØB submitted. (A "JØB" to CPS-RJE is the result of concatenating all Load/Save file segments specified in the CPE-RJE "schedule" command.) CPS-RJE will provide an 8 character jobname for each JØB. The jobname will be constructed from the master account name and a CPS-RJE assigned JØB number. The jobname will be printed at the user's terminal after the "schedule" command has been entered.

CONVERSATIONAL PROGRAMMING SYSTEM - REMOTE JOB ENTRY (Cont'd)

CPS-RJE Messages

The following messages may appear at "schedule" time:

Message: RJE QUEUE FULL. RESTART.

Meaning: CPS-RJE places information into a table for each J0B scheduled for submission to HASP. This table can contain up to 10 entries of data. If J0Bs are being scheduled more quickly than CPS-RJE can process them, this table will become filled and the above message will appear at the user's terminal.

User Response: Take a moment to relax and reenter the "schedule" command.

Message: RJE SCHEDULER N0T 0PERATIVE

Meaning: The RJE scheduler routines have been disabled by the operator and J0Bs are not being accepted for submission to HASP (users may still operate in RJE mode). This situation should not arise unless some unanticipated and terrible crisis involving CPS-RJE is taking place at the Computer Centre.

User Response: Bear with us and try again later. Check with the C0DA-PH0NE (928-6234) to determine when the scheduler is expected to be operational.

Message: SCHEDULER I/O ERR0R - RESUBMIT.

Meaning: The CPS-RJE scheduler encountered an error in entering the schedule information into the schedule table.

User Response: Please try again. If the problem recurs contact Mr. S. Goldfarb (928-3787).

Message:
```
JOB Gxxnnnnn ENTERED SCHEDULE QUEUEqq
             AT hh:mm:ss       yy.ddd
```

Meaning: The J0B has been entered into the CPS-RJE schedule queue and is awaiting the necessary processing prior to submission to HASP. Gxxnnnnn is the jobname assigned to the J0B; the time and day are indicated by hh:mm:ss and yy.ddd, respectively.

User Response: None

CONVERSATIONAL PROGRAMMING SYSTEM - REMOTE JOB ENTRY (Cont'd)

Job Completion

After CPS-RJE processes a scheduled JØB (i.e. inserts the JØB card, checks for card continuation errors), the JØB is submitted to HASP for processing under OS. The user may determine if the JØB has been submitted to HASP by issuing the CPS-RJE "find" command:

a) If the JØB was submitted to HASP, the format of CPS-RJE's reply to the "find" command will be:

```
    JØB Gxxnnnnn CØMPLETED AT hh:mm:ss     yy.ddd
```

where Gxxnnnnn is the jobname for the JØB

This message does not mean that the JØB was run and completed; it means only that the JØB was processed by CPS-RJE and passed over to HASP. The JØB may or may not have already been processed by HASP.

b) If the JØB failed because of some error detected by CPS-RJE, the JØB will not be passed to HASP at all. The CPS-RJE reply to a "find" command for unsuccessful RJE JØBs is of the form:

```
JØB Gxxnnnnn ENTERED TERMINAL ØUTPUT QUEUE qq
             AT hh:mm:ss              yy.ddd

'.......card image......'

IN 'member' IS ILLEGAL. JØB CANCELLED.
```

The "card image" is that of the card which was being examined when the error was detected. The "card image" indicated may not always contain the actual error; a previous card may sometimes cause an error which does not become apparent till later on in the processing. The "member" is the name of the Load/Save File segment which contains the indicated "card image".

Users can correct their errors using the CPS editing facilities and resubmit the JØB. No HASP records will be available for JØBs that fail in CPS-RJE processing.

Output Retrieval

To obtain the HASP output for the JØB, present the CPS-RJE output containing the JØB ENTERED SCHEDULE QUEUE and JØB COMPLETED messages at the UTCC "Post Office". These two CPS-RJE messages provide the jobname for the scheduled JØB and indicate that the JØB was successfully inserted into the HASP system. These two CPS-RJE messages will serve as the "ticket stub" for retrieving output.

CONVERSATIONAL PROGRAMMING SYSTEM - REMOTE JOB ENTRY (Cont'd)

Special Job Requests

Users are asked not to submit at present, any JØBs requiring a Special Job Request Form. (WRITE ENABLED TAPE MØUNTS). A means for handling such JØBs is currently being examined.

Punched Card Copies of RJE Load/Save File Segments

Users can obtain punched card copies of their programs by using the member "cards" from the CPS Public Library. The user may "load" the Load/Save file member into his own work area, append an accounting card (as statement no. 10) and save the new member in his own library. The user can then concatenate the segment "cards" with the RJE Load/Save file segments to be punched.

e. g.

```
load(cards,keys)public;
image?;
IMAGE 029;
bbbb###0"-----------------------------------------------   -------------

10       //             accounting information),name,msglevel=(1,1)
save(cards);
sched.(cards//seg1//seg2//...//segn);
```

Note: The user should remove any '/*' cards appearing in seg1, seg2, etc. The last segment concatenated (segn) should contain a '/*' as the final card image.

Known Errors

During initial testing of CPS-RJE, one serious problem was encountered occurring randomly and infrequently: card images are sometimes duplicated or lost. Credit requests will, of course, be honoured for users encountering this difficulty. Users are asked to provide a copy of the CPS-RJE segment involved as well as the time of scheduling in addition to the HASP output. This information will be helpful in determining the extent and frequency of the problem. Credit requests may be submitted to Mrs. C. Davidson, Room 115A, Sandford Fleming Labs.

Inquiries

Any questions concerning CPS-RJE may be directed to Mr. S. Goldfarb (928-3787).

ALGOLW PROCESSOR NOW AVAILABLE

The ALGOL W processor from Stanford University is now available through both the high speed job stream and the general purpose batch job stream.

The processor is utilized through the high speed job stream on the Undergraduate terminals with the following deck setup:

```
                      2              4          4
Column  1       7     2              3          8
        $JOBG   name  SAAANNN     TTTT        LLL
        BEGIN
            (Algol W program)
        END
        $DATA
        (data cards if required)
```

where name - is the program identification
SAAANNN - is the security and authorization code
TTTT - is the time estimate in seconds and tenths which should be right justified in column 43 e.g. 156 means 15.6 seconds
LLL - is the line estimate in 100's right justified in column 48. e.g. 2 means 200 lines.

The maximum and default time and line estimates are 20 seconds and 300 lines.

The processor may be obtained through the batch job stream by using the procedure ALGØLWCLG.

E.g.

```
Column 1
       //TEST1  EXEC    ALGOLWCLG
       //ALGOLW.SYSIN DD    *
       BEGIN
           (Algol W program)
       END
       /*
       //GØ.SYSIN  DD  *
          (data cards as required)
       /*
       //
```

ALGOLW PROCESSOR NOW AVAILABLE (Cont'd)

The default execution time and line estimates are 1 minute and 1000 lines. To override these limits the following EXEC card could be used:

```
//TEST2  EXEC  ALG0LWCLG,PARM.G0='1:50,500'
```

to give 1 minute and 50 seconds execution time and 500 lines of output.

Use of the ALG0LWCLG procedure provides all the facilities of the linkage editor.

The ALG0LW language is described in "Introduction to ALG0LW Programming" by Henry R. Bauer and "CS110 ALG0LW (revised)" both published by the Computer Science Department, Stanford University. Bound volumes containing both of these manuals may be obtained from the University of Toronto Bookstore.

SUPPORTING THE IBM 7094 II

Many months ago the possibility of decommissioning the 7094 computer was discussed, with the end of June, 1971 a proposed date. Later, the Computer Users' Committee advocated that at least one year of advanced notice be provided, to which the Centre concurred.

Since then a relatively even workload has been serviced in a rather uneven way. Clearly the 7094 remains a powerful machine; its deficiencies are primarily a matter of support. We are pleased, therefore, to be able to announce the appointment of Mrs. Joyce Walton as manager of 7094 activities. She may be reached at 928-8697 or, after February 7th, at 928-7094. Mrs. Walton will be most responsive to expressions of users' viewpoints on all aspects of 7094 service.

Mrs. Walton has been active as a principal in the firm of J. T. Hewton and Associates for several years. Prior to that association she was employed as a scientific programmer and analyst by Computing Devices of Canada and by Univac. For a brief period of time she supervised activities at the Metro Toronto traffic computer. Scientific computation and the FORTRAN language are her specialties.

SUPPORTING THE IBM 7094 II (Continued)

Under Mrs. Walton's direction, the following changes are planned for 7094 services:

- effective February 8th, a telephone enquiry service for 7094 users will be established. Call local 7094. (Phone 928-7094);
- commencing at 4:00 p.m. Thursday, February 19th the input/output facilities will be shut down preparatory to their relocation to Room 1203, Burton Tower;
- commencing on or before 12:00 noon Tuesday, February 24th all 7094 input/output services will be provided from the 7094/1401 location, Room 1203, Burton Tower. Cards and printout will no longer be handled in the Sandford Fleming Building after February 19th;
- CALCOMP arrangements will be announced shortly;
- after February 23rd, until further notice, the hours for receipt of input and delivery of output will be strictly limited to 9:00 a.m. through 5:00 p.m., Monday through Friday, except by special arrangement;
- turnaround will be improved dramatically, both in extent and predictability. Future announcements will detail improved classes of service.

It should be emphasized that UTCC continues to consider it unwise for users to undertake new development work on the 7094. This system should be used primarily for de-bugged programs preferably requiring relatively little input/output per unit of computation. Assistance will be provided, over a period of time, to all 7094 users in modifying their programs for "portability", so that eventual displacement of the 7094 will cause minimal disruption.

Now that the Centre is prepared to service 7094 work on an improved basis we expect to be able to judge from the response whether to plan an early decommission of the 7094 or to plan still further system enhancements. We hope for the guidance of a positive response to these immediate changes.

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES

The Statistical Package for the Social Sciences (SPSS) is a high level programming language which has been designed to enable social scientists to perform statistical analyses of data on a computer. In order to give the user a flexible data base, it contains powerful data management facilities which can be used to recode, weight, sample and transform data either permanently or only temporarily for some one statistical procedure.

There are various ways in which data can be entered into SPSS. The most commonly used method is to include the data cards with the program. However, in order not to lose generality, there are several techniques in SPSS for communicating with external files which may consist either of data only or SPSS system files created in previous runs.

Some other salient features are the following:

- labels may be specified for printing with variables,
- up to three values may be specified for each variable to be treated as missing data (each statistical function has a set of options pertaining to how missing values will be treated),
- cases may be selected from the input variables according to specified values,
- large populations may be sampled prior to analysis.

Statistical Functions

The following is a brief description of the statistical functions available and their features:

One-Way Frequency Distributions and Simple Data Description

CONDESCRIPTIVE:	Provides descriptive statistics for continuous data. Includes mean, standard deviation, variance, standard error, etc.
CODEBOOK:	Provides frequency distributions plus the same statistics as CONDESCRIPTIVE in Codebook format.
MARGINALS:	Same statistics as CODEBOOK plus Histograms.

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES (Cont'd)

Two-Way to n-Way Frequency Distributions

CROSSTABS:	Provides two-way to n-way cross-tabulation with an upper limit of 10-way tables. For two-way tables, statistical output includes Chi-square, Cramer's V, Kendall's tau B and C, the gamma statistic, and Sommer's D. For n-way tables a sequence of two-dimensional cross-sections is produced.
FASTABS:	Provides the same statistics as CROSSTABS but is much faster since it operates on numeric quantities only and has an upper limit of 8-way tables.
BREAKDOWN:	Provides a description, similar to CROSSTABS and FASTABS, of strata and substrata of a population.

Bivariate Correlation Analysis

PEARSON CORR:	Produces zero-order or product-moment correlation coefficients suited for normally distributed data on an interval scale.
NONPAR CORR:	Used to compute either Spearman (R) or Kendall (tau) or both rank-order correlation coefficients.

Multivariate Correlation Analysis and Regression

PARTIAL CORR:	Provides a single measure of association (partial correlation coefficient) between two variables while adjusting for one or more additional variables. It also provides one- or two-tailed significance tests, means, standard deviations and zero-order correlations with their degrees of freedom and their significance.
REGRESSION:	Performs stepwise, polynomial, harmonic and asymtotic regression, and calculates path coefficients allowing the user to specify the number of steps and admissable F-levels.

Guttman Scaling and Factor Analysis

GUTTMAN SCALE:	Performs Guttman Scalogram Analysis for up to 12 variables in a scale and up to 50 Guttman scales.

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES (Cont'd)

Guttman Scaling and Factor Analysis (Cont'd)

FACTOR: Performs factor analysis with up to five factoring methods (principal factoring with or without iteration, Rao's canonical factoring, alpha factoring, and image factoring) and four rotational methods (Oblique rotation; and Equimax, Varimax and Quartimax orthogonal rotation).

Operational Details

The principal attraction of SPSS is the ease in learning it and that it assumes no previous knowledge of programming or even using a computer. SPSS has been implemented on System/360 and there are currently two procedures for accessing it.

1. 360 JOB card

```
//ƀƀEXECƀƀSPSS

//SPSS.SYSINƀƀDDƀƀ*

  SPSS program and
  data go here

/*
```

This procedure should be used for runs which do not require any external input or output other than printed output and //SPSS.SYSIN input.

2. 360 JOB card

```
//ƀƀEXECƀƀSPSSTP[,INFILE=VVVVVV][,OUTFILE=XXXXXX][,]
          [INSER=YYYYYY][,OUTSER=ZZZZZZ]
//SPSS.SYSINƀƀDDƀƀ*

  SPSS program and
  data go here.
/*
```

(Quantities in square brackets [...] are optional).

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES (Cont'd)

This procedure can be used for runs which require SPSS system tape file input or output, or BCD tape input or output. For SPSS system tape file input, VVVVVV must be replaced by the data set name and YYYYYY must be replaced by the tape volume serial number,

e.g.

```
//b̸b̸EXECb̸b̸SPSSTP,INFILE=MYFILE,INSER=N9999
```

For SPSS system tape file output, XXXXXX must be replaced by the data set name and ZZZZZZ must be replaced by the tape volume serial number,

e.g.

```
//b̸b̸EXECb̸b̸SPSSTP,OUTFILE=OURFILE,OUTSER=N7777
```

For BCD input and /or output //SPSS.BCDIN and /or //SPSS.BCDOUT dd override cards must be provided.

Please refer any opinions, advice, or problems to Andy Kowaliw, Room 130 Sandford Fleming Laboratories. Telephone: 928-8701.

PRODUCTION DATA

The annual cycle of work at the Computer Centre relates characteristically to the cycles in teaching and research activities. The graphs (Figures I and II) profile the semicycle from July through December 1970, for the S/360 general job stream and for the high speed job stream (Engineering and Arts & Science Undergraduate Terminals plus remotes).

The level of traffic at each November peak tends to equal the high mark of the previous March, and each March exceeds any previous peak. An increase in the memory size on one of the S/360-65s is our specific preventative medicine for the load of the oncoming March.

FIGURE I

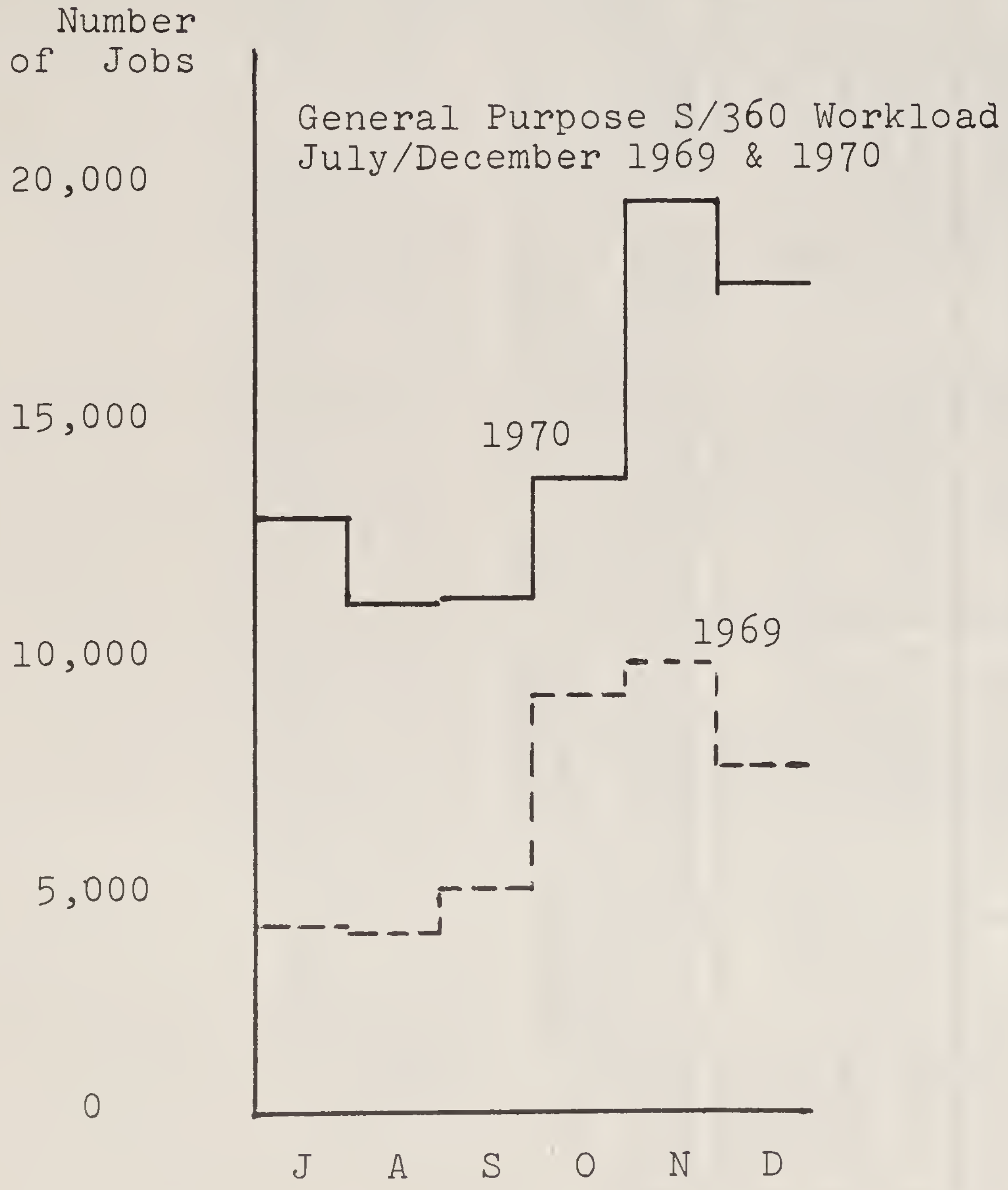
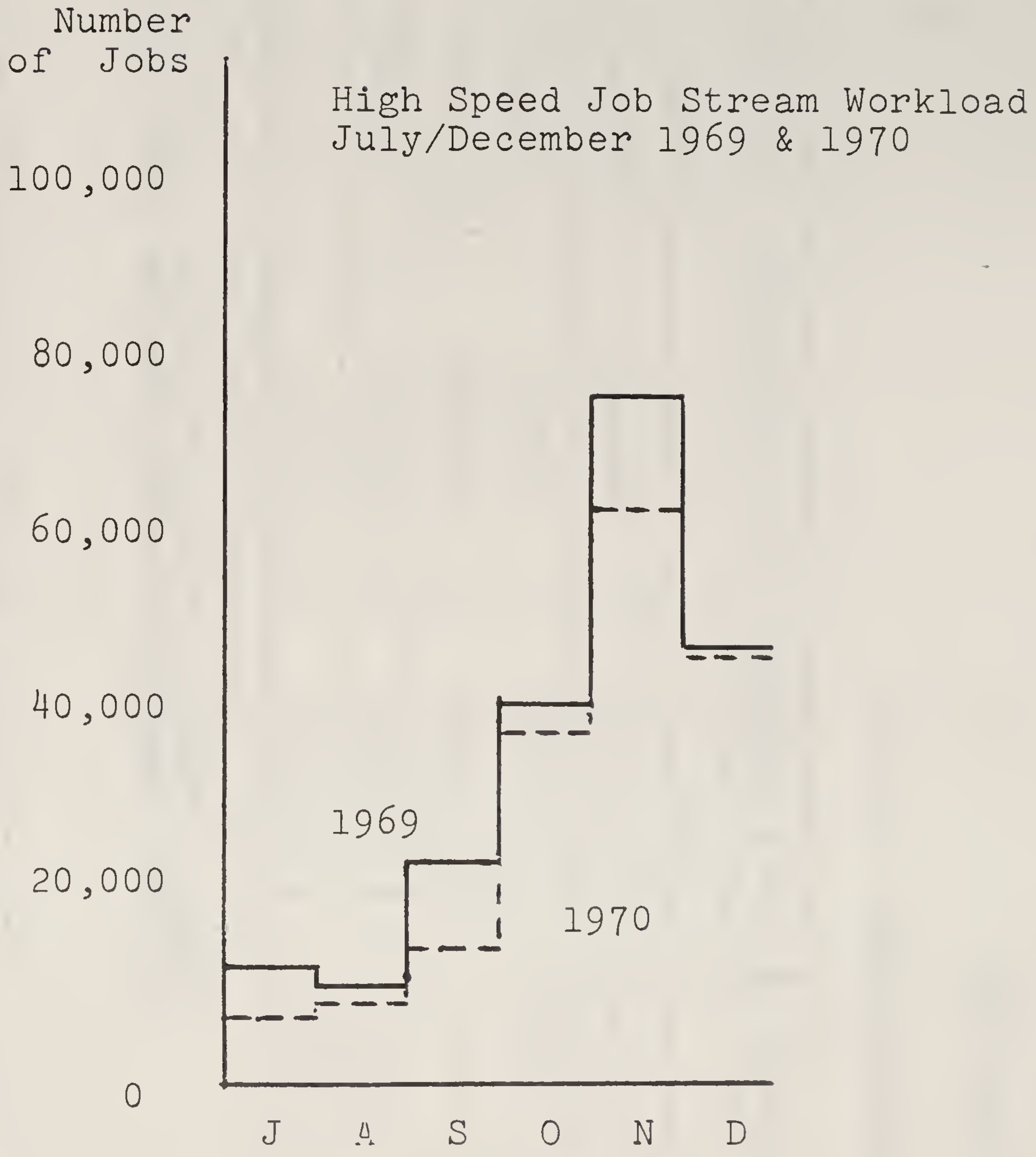

General Purpose S/360 Workload
July/December 1969 & 1970

FIGURE II


High Speed Job Stream Workload
July/December 1969 & 1970

PRODUCTION DATA (Cont'd)

Detailed data on all systems for the last three months (Table I) and a December 1969 to December 1970 comparison (Table II) are shown below.

System	October	November	December
S/360s	13,746	19,709	17,868
7094	1,753	2,090	1,429
HSJS	41,094	75,193	47,486
TOTAL	56,593	96,992	66,783

TABLE I Number of Jobs Processed
October through December 1970.

System	Dec./69	Dec./70	Change
S/360	7,345	17,868	+143%
7094	3,983	1,429	– 64%
HSJS	46,023	47,486	+ 3%
TOTAL	57,351	66,783	+ 17%

TABLE II Comparison of Production
December 1969 and December 1970

SYSTEM RELIABILITY

System	Month	Uptime	M.T.B.F.
S/360 #1	November	97.8%	11.5 hours
	December	97.4%	8.8 hours
S/360 #2	November	96.7%	11.2 hours
	December	98.0%	11.5 hours

The above table indicates the continued high system reliability, the only significant change being the drop in M.T.B.F. on System 1. This was caused by a rash of software problems which are currently being investigated.

MORE CORE AND JOB CLASSES STARTING FEBRUARY 1, 1971

An additional 256KB of core storage has been installed on our S/360 #2. Several class changes have been made to permit full advantage to be taken of its presence. Class V will be available to local and remote terminals on both systems. RUSH and IOI service levels will be provided by classes T and K respectively.

Class C (special forms setup) has been removed from the class structure as software changes have made this class restriction unnecessary. Former users of this class should reclassify their jobs according to the core and setup requirements of the job.

CAUTION: Data sets catalogued by the user will not be automatically copied onto both systems, hence if your job is submitted for execution on the other system, it will terminate with the message 'Data Set not found'. For advice on how to avoid this problem please contact the Users' Service Group.

SUMMARY OF JOB CLASSES, EFFECTIVE FEBRUARY 1, 1971

	Class Code & Service Level			System No.
Class Definition	RUSH	ASAP	IOI	
1. Less than 110K no tape or disk mounts	T	V	K	**
2. Less than 200K, no tape or disk mounts	R	A	I	*
3. Less than 200K, one disk, and one or two 9 track tape, and one or two 7 track tape mounts	S	B	J	1
4. Less than 200K and two disk mounts plus tape mounts if required	-	D	-	1
5. Jobs requiring more than 200K and less than 300K. These jobs may have mounts as per Class D.	-	E	M	*

6. Jobs whose time, line or punch estimates exceed 30 minutes, 30,000 lines or 10,000 cards respectively, must be scheduled with the Chief Operator, (Sandford Fleming Building, Room 112, or Telephone: 928-5058).

NOTE: This also includes jobs whose 'elapsed time' on the system is expected to exceed 60 minutes.

Class Definition	RUSH	ASAP	IOI	System No.
7. Jobs requiring more than 300K and less than 350K will be processed under MVT	-	O	-	+

** Jobs submitted via a HASP remote terminal or CPS/RJE will be processed on SYSTEM 1. Jobs submitted locally will be processed on SYSTEM 2.

* As above excepting local users have the choice of System 1 or System 2 for job submission.

+ These jobs may be processed on System 1 or 2 at the discretion of operations.

REVIEW OF THE JOB CLASS SYSTEM

In order to assure rapid throughput of RUSH jobs these are arbitrarily limited to 5 minutes maximum time estimate and 5000 lines of output. This helps keep the ASAP classes moving as well.

RUSH jobs cost twice as much as regular (ASAP) jobs. The only work to be run ahead of your RUSH job is any other RUSH job already in the backlog.

ASAP jobs are at regular price and, if less than 5 minute estimate, are processed First-In-First-Out, inhibited only by any RUSH traffic. ASAP jobs over 5 minutes precede any IOI jobs.

The lowest price is at 60% of regular. These classes are thought to backlog for execution If the system would Otherwise be Idle. Except in particularly busy weeks the IOI classes are usually serviced overnight. Long jobs or ones for which output is not vitally needed are best placed in this category.

Note that jobs referencing the library disk TIC014 need not be setup class because of that disk. It is always mounted and is accessible from either system.

Class O is required for jobs which will not run under HASP. The user is treated as buying the whole machine at $400.00 per hour from OS job start to job end times.

Summary:	Classes	R, S, T,	are	RUSH
	Classes	A, B, D, E, V	are	ASAP
	Classes	I, J, K, M	are	IOI
	Class	O	is	special

TECHNICAL TIP

HOW TO CALCULATE MAGNETIC TAPE FOOTAGE REQUIRED FOR A DATA SET

A problem often encountered by users new to magnetic tape usage is that of estimating the correct length of tape required. The following formula will, hopefully, alleviate this problem.

$$\text{Tape footage required} = \left(\frac{B}{800} + \frac{1}{2}\right) \times \frac{N}{12}$$

where B is the blocksize (i.e. record length x the blocking factor)

N is the total number of blocks in the file.

For example, if a file contains 1000 blocks, each block consisting of 4000 bytes then the required footage is

$$\left(\frac{4000}{800} + \frac{1}{2}\right) \times \frac{1000}{12}$$

= 458.5 feet

If the exact number of blocks is not known, estimate the number as closely as possible, calculate the required footage, and add a correction factor (such as 20 or 30% of the calculated footage).

TECHNICAL TIP

CONCATENATION OF LIBRARIES

If a program requires subroutines from several libraries, such as the IBM Fortran library and the ICS library, these two libraries can be concatenated to SYS1.FØRTLIB in the following way:

```
Jobcard

// EXEC FØRTGCLG
//FØRT.SYSIN DD *
fortran source deck
/*
//LKED.SYSLIB DD DSN=SYS1.FØRTLIB,DISP=SHR
// DD DSN=IC.IBMFSSP,DISP=SHR
// DD DSN=IC.ICSLIB,DISP=SHR
//GØ.SYSIN DD *
data
/*
//
```

or, if we use the loader instead of the linkage editor:

```
Jobcard

// EXEC FØRTGLDG
//FØRT.SYSIN DD *
fortran source deck
/*
//GØ.SYSLIB DD DSN=SYS1.FØRTLIB,DISP=SHR
// DD DSN=IC.IBMFSSP,DISP=SHR
// DD DSN=IC.ICSLIB,DISP=SHR
//GØ.SYSIN DD *
data
/*
//
```

In the case that the same subroutine name exists in both libraries (IBMFSSP library and ICS library) the routine in the first library will be taken. If that is not the intention the DD cards should be interchanged.